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THE EGG CARRYING HABIT OF ARAWANA OF THE AMAZON

Arawana or arawona, *Osteoglossum bicirrhosum* Vandelli, was captured by me in a small lagoon near Santerem on the Amazon River during the dry season of December, 1909. One specimen had a few large eggs containing large embryos, in the bag or pouch-like space between the bones of the lower jaw. The natives claim that all the arawana carry eggs in their mouths to incubate them, etc. The specimen and eggs are in the Carnegie Museum of Pittsburgh, Pa.

J. D. HASEMAN,
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FURTHER NOTES ON THE COTTOID FISHES OF THE GREAT LAKES

The writer has lately accumulated some further data on the status and distribution of the cottoid fishes of the Great Lakes, which supplement his paper, *Nomenclatural Notes on the Cottoid Fishes of Michigan*[1].

1. *Cottus bairdii* Girard.

The record of *Cottus ictalops* from Georgian Bay, by Bensley[2], and of *Uranidea Richardsoni* from New Brunswick, by Cox[3], presumably were based on

[1]Occ. Pap. Mus. Zool., Univ. Mich., No. 65, 1919. pp. 1-9.
[2]Contr. Can. Biol., 1911-1914 (1915), p. 49.
[3]Cox, Bull. Nat. Hist. Soc., New Brunswick, No. 13, 1896, p. 48.

specimens of this species, the northern representative of *Cottus meridionalis.* At both of these localities, as elsewhere in the range of the species, *Cottus bairdii* is associated with *Cottus gracilis,* or its Great Lakes representative, *Cottus franklinii.*

2. *Cottus franklinii* Girard.

Cooper[4] has recorded a cottoid fish from Lake Ontario, at Port Credit, Ontario, under the name of *Uranidea formosa,* as the host of the cestode parasite, *Schistocephalus solidus.* Like the type of *Cottus formosus* Girard[5] described from the same lake, the specimens were taken from the stomach of a ling (*Lota maculosa*). The original description of the partially digested type of *Cottus formosus* contains little that is tangible; the small size of the head there mentioned, presumed by Jordan & Evermann to be diagnostic of the species, can scarcely be considered significant, as the fore part of the head of the type was destroyed. Unless contrary evidence is forthcoming, the specimens recorded by Cooper may be regarded as topotypic of *Cottus formosus.* As these specimens, which Dr. Cooper has kindly presented to the Field Museum, are referable to *Cottus franklinii, Cottus formosus* Girard may be added to the synonymy of that species.

Cottus franklinii is thus known from Lakes Superior, Michigan, Huron[6] and Ontario. The record of *Uranidea formosa* from Madawaska River, New Brunswick, by Cox (*l. c.,* p. 49) was probably based on a specimen of *Cottus gracilis.*

3. *Cottus ricei* (Nelson).

Another specimen of this deep-water species, which has been rarely reported, was found on the shore of Lake Michigan, near Winnetka, Illinois, where it

[4]Illinois Biol. Monog., 4, 1918, p. 321.

[5]Smiths. Contr. Knowl., 3, 1851, p. 58.

[6]The writer in his previous paper overlooked Bensley's record of *Uranidea franklini* from Georgian Bay (Contr. Can. Biol., 1911-1914 (1915), p. 49, fig. 6).

had been driven with numerous other fishes by a storm, on July 8, 1919.

Prickles absent; dorsal rays, VIII, 17; anal rays, 14; pectoral rays, 16; depth, about 6.8; head, 3.6; eye, 4.7; upper jaw, 3.3; length of preopercular spine from angle of ridge into eye, 1.2; length to caudal base, 89 mm.

CARL L. HUBBS,
Chicago, Ill.

OBSERVATIONS ON THE HIBERNATION OF THE BOX TURTLE

On December 2, 1917, while setting a line of mouse traps on the property of the Washington Biologists' Field Club at Plummers Island, Maryland, my attention was attracted by a small opening in the ground partly covered by fallen leaves. On lifting aside the rubbish to afford a better view I found that this hole formed the entrance of a small cavity in which a box turtle (*Terrapene carolina carolina* [Linn.]) had begun hibernation for the winter. The opening had been made within a few days, as the earth about it was still loose and crumbling. Apparently the turtle had worked its way into the humus until its shell was covered and then had turned so that its side was presented to the opening. The sides of the entrance hole were somewhat broken, but the opening was still about three inches broad and two inches high. Above the turtle was covered by two and one-half inches of earth, while one hind-foot and the posterior half of the left side were exposed at the entrance within two inches of the surface. The rest of the animal was covered closely by the loose earth surrounding it. The site chosen for hibernation was near the border of an open deciduous woods, on a gently inclined southern slope.

The location was marked and observations were made upon this turtle at intervals during the follow-

ing winter and spring, care being taken to avoid undue disturbance. The animal did not change its position and the opening into the cavity was not filled with earth. Drifting leaves covered the spot and later these were packed firmly by the fall and melting of snow. The winter proved to be exceptional for the vicinity of Washington for its severity and for the unusual snowfall. February 1 snow lay in these woods to the depth of sixteen inches.

On March 3, 1918, with the melting of the snow, I found that the earth had sunk away around the turtle until one-third of the shell was uncovered. The animal, however, had not changed position. On March 24 it had left the slight excavation in which it had spent the winter, but had moved only a few inches to one side, where it lay in the entrance of the cavity with its head protruded slightly under cover of the leaves. A week later, on March 31, it was still in the same position. On looking closely I found that its eyelids were glued shut by some exudate so that the animal was unable to see. However, it was alert as it retracted the head quickly when I rustled the leaves near it. On April 7 it had gone. From the condition of the opening I judged that it had left three or four days previous. The length of time that this turtle lay quiescent after moving to the surface was remarkable. Warm rains that occurred after March 31 may have induced further activity.

On March 31 a second box turtle that had emerged from winter quarters was found in another spot on this same property. The shell of this animal was encrusted with mud on the sides and top and dried earth clung to the head and legs. A foot away was the spot where it had spent the winter, a slight excavation in a heavy clay soil, under shelter of a growth of weeds. The opening in the ground was merely large enough to contain the turtle. On the bottom was a distinct imprint of the plastron. Apparently the center of the carapace must have been bare

of earth, though leaves had blown in over it and had matted down to form a suitable covering. Two feet away was a second cavity similar to the first that had been occupied by another box turtle. These two sites were on the broad top of a slight knoll in an old weed-grown field ten feet from the border of the woods.

Dr. A. K. Fisher states that during the past fifty years he has found many box turtles in hibernation and that all were resting in shallow excavations with only a slight protection of earth above them. This seems, therefore, to be the normal ordinary manner for them to spend the winter. They rely apparently upon the drifting of fallen leaves and the breaking down of surrounding herbage to aid in giving them sufficient cover.

ALEXANDER WETMORE,
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NOTES ON AMPHIUMA AND NECTURUS

The northern water dog *(Necturus maculosus)* is not a common animal here at Raleigh and never attains the size of northern specimens. From 1894 to the present time I have records of twenty-one specimens, though others, not recorded, have also been taken. Of these, one was taken in February, nine in March, eight in April, two in May and one in November. So far as I know, all were caught on hook and line in Neuse River, and of the seven of which measurements were preserved, the smallest was 144 and the largest 186 mm. in length. None approached *N. punctatus* in any way except in the small size, the markings being those of *maculosus* as well as the structural characters.

The ditch eel *(Amphiuma means)* appears to be abundant in the wet swampy meadows along Walnut Creek, and in all other suitable situations, but is seldom found except by men engaged in digging or in cleaning out old ditches in such places. One man

informed me that when an old ditch was cleaned out, the eels burrow into the sides of the ditch, and that when the water is drained off from the ditch and it begins to run in from the surrounding meadow, the eels come back and can be caught. He also said that they were caught in cleaning out old ditches, not in digging new ones. I have never myself come across a living specimen here, though I suppose at least two hundred specimens have been brought to me, perhaps twice that number; but have come across a few dead ones, perhaps a dozen in all. They are universally feared as poisonous, presumably on account of their snake-like form, but are always called "eels," never "snakes," the usual name at present among the ditchers being "ditch eel"; though in former days, and at present among fishermen, "lampus eel" was the more common name. At Greensboro, Alabama, "lamper eel" is the common name, while Dr. J. W. P. Smithwick, who once sent me one from Bertie Co., N. C., said that in that vicinity it is commonly known as "deaf adder." I have never heard the names "congo eel" or "congo snake" applied to the species, and have often wondered if it was not a corruption and misapplication of "conger eel."

In size I have seen specimens as small as three inches in length, and as large as twenty-eight inches. The small ones were taken in February (Feb. 22, 1894; Feb. 24, 1916), but none possessed gills. I have never taken eggs in this locality.

The "voice" of this species, which I have frequently seen alluded to in literature, appears to me to be nothing more than the noise caused by the expulsion of air through the spiracles, and is not, I believe, a "voice" in the accepted sense of the word, any more than a cough or sneeze is.

As to the animal's food I know but little; crayfish, however, have been found in a few stomachs, and large clawed crayfish at that. In captivity they will live indefinitely in water that contains plenty of rot-

ting vegetable matter, but putrid animal matter in the water kills them very quickly.

C. S. BRIMLEY,
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EGGS OF THE SWAMP TREE FROG

While traveling along the state highway in the southern part of Logan, Utah, on the 15th of May, 1919, I heard great numbers of the swamp tree frog, *Pseudacris triseriata,* uttering their characteristic songs. I found this amphibian very common in small ponds at the roadside, and there were scores of egg masses, attached in most cases to blades of grass. No tadpoles had yet appeared. So numerous were the egg masses that I collected a representative lot of them. The number of eggs in the twenty-two egg masses taken were as follows: 66, 45, 53, 33, 65, 46, 88, 38, 40, 67, 32, 50, 64, 87, 77, 15, 65, 51, 73, 45, 130, and 190.

The number of eggs here found is much greater than that typical of the species as given by Dickerson in The Frog Book, *i. e.,* 5 to 20 (page 159). The masses containing 130 and 190 eggs respectively seem extreme. There is a possibility that two egg masses became fused in these cases, but except for the fact that the numbers of eggs are unusually high there is no reason for believing so, as the gelatinous material remained in one compact body, and gave no evidence of a multiple origin.

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NOTE ON *MELANEMYS* SHUFELDT

Dr. Shufeldt has recently (Aquatic Life, August, 1919, pp. 155-7) described a new genus of turtles based on *Clemmys guttata, C. muhlenbergii* and *C. marmorata.* He names no type.

Without going into the merits of the classification proposed in Dr. Shufeldt's paper, I wish to point out that Agassiz in 1857 proposed separate genera for each of the three species named above. Therefore, Dr. Shufeldt's name is a synonym.

In order to eliminate possible confusion in the future, I hereby designate *Testudo guttata* Schneider, 1792, as the type of *Melanemys* Shufeldt, 1919, which is thus rendered synonymous with *Nanemys* Agassiz, 1857.

E. R. Dunn,
Cambridge, Mass.

TWO NEW VIRGINIA RECORDS

I wish to put on record two additions to the Virginia fauna which are represented by specimens in the National Museum. Thanks are due to Dr. Stejneger for the opportunity to see these:

Stereochilus marginatus. U. S. N. M. No. 49512. Dismal Swamp, Va. Collected by Dr. A. K. Fisher in 1895.

Clemmys insculpta. U. S. N. M. No. 61095. Mouth of Little Pimmitt Run, Fairfax Co., Va. Collected by E. A. Preble on August 25, 1918.

E. R. Dunn,
Cambridge, Mass.

Edited by J. T. Nichols, American Museum of Natural History
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